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Vol. CCXXXVI No. 6031 — LONDON, MARCH 22, 1951 — PRICE 8d

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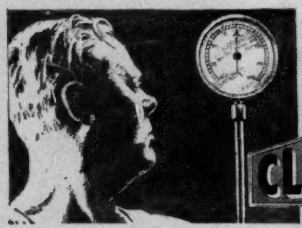

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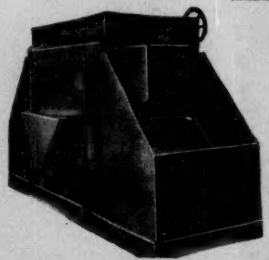

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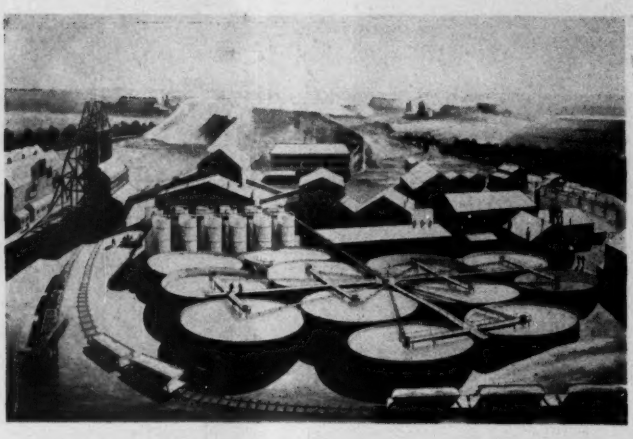

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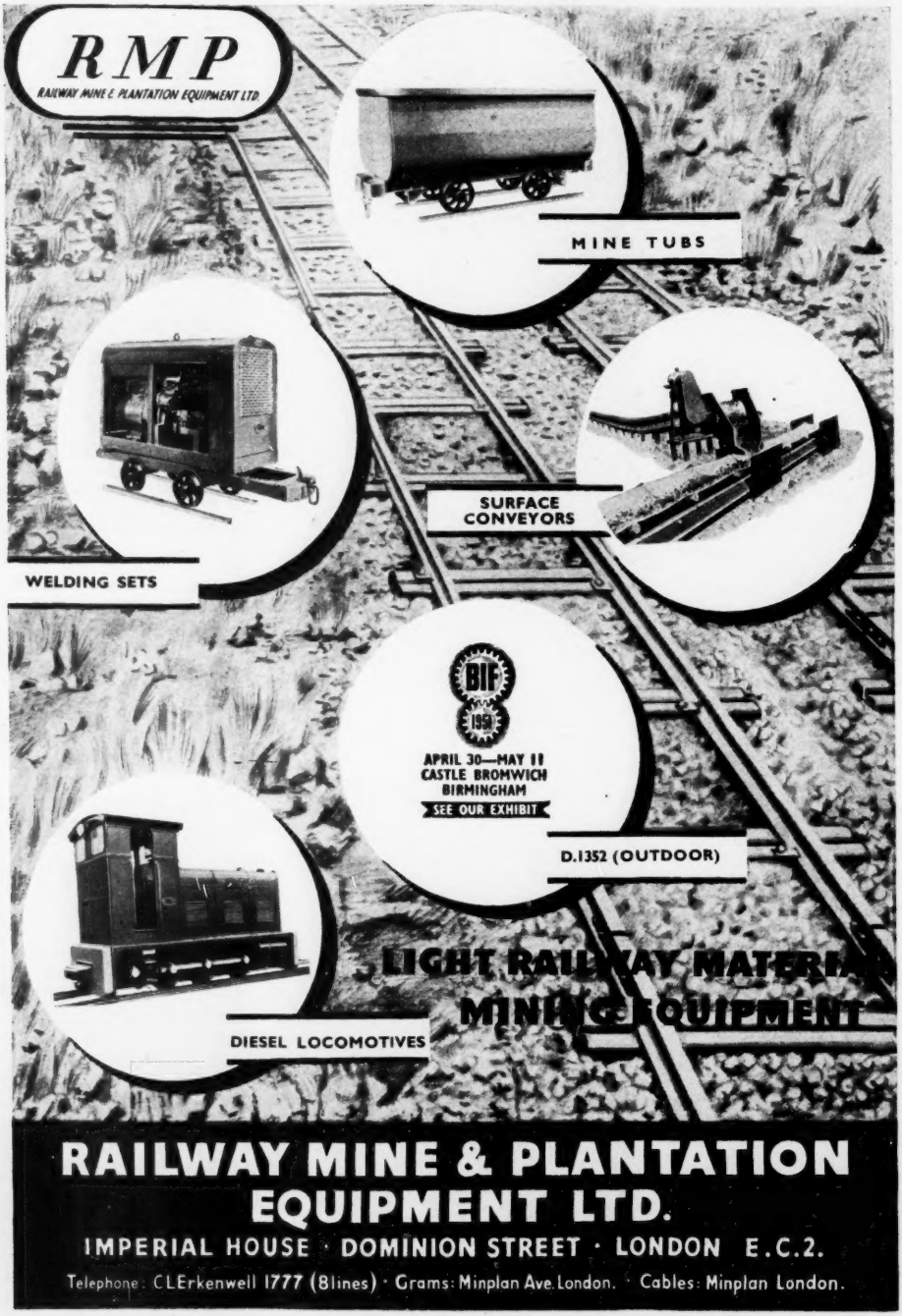
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The Mining Journal
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Vol. CCXXXVI No. 6031 LONDON, MARCH 22, 1951 PRICE 8d

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THIS WEEK'S FEATURES

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NOTES AND COMMENTS

Nationalization Threatens Persia's Oil

The unanimous decision by the Majlis, or lower House of Persia, to "nationalize" the country's important oil industry is one of the many unfortunate consequences of the 1939-45 war. The joint occupation of Persia by this country and the U.S.S.R., after the pro-German rising; inflation; lack of long-overdue economic and social developments, in spite of high-sounding plans, worked out with great care by foreign, especially U.S. experts; the recent profit-sharing agreement, on a fifty-fifty basis, concluded after about one week's negotiations, between the Arabian American Oil Co. (ARAMCO) and Ibn Saud, and last, but by no means least, the incessant growth of nationalism all over the Middle East on the one hand, and Persia's precarious place in the international situation on the other, are factors which have to be taken account of when attempting to appreciate the recent threat not only to the Persia oil industry as such, but in equal measure to the oil supplies of this country and the U.S.A. The threat is real and grave: while the oil committee of the Majlis has been given two months to find ways and means to carry out nationalization, there can be little doubt that, given the present xenophobic mood and dire financial plight of the country, the advocates of nationalization, both on the extreme right and on the extreme left, will have their way, regardless of consequences. Western reasoning, emphasizing the lack of capital, know-how, and personnel, often bears little relation to the realities of the situation as seen by an ancient Eastern people with a long history. However, unless moderate council should still prevail, Persians undoubtedly will seriously injure their own interests.

Persia is the most important Middle Eastern oil producer with an output of 31,750,000 tons in 1950 (26,807,000 tons in 1949), derived, in the main, from four fields, covering 160 miles north to 165 miles east of Abadan, the huge refining centre. During the war, output fell to 6,600,000 tons and amounted to 9,600,000 tons in 1939. The 1949 refining record of 23,245,000 tons was probably exceeded in 1950. According to de Goyler, the country's reserves are estimated at 855,000,000 tons. The Anglo-Iranian Oil Co.'s investments in Persia are the largest investment made by any company operating abroad. The terms of the 1933 concession, which expires in 1993, provide for arbitration before the Permanent Court of International Justice. Moreover, the British Government has already clarified its position in a note to the Persian Government, the patient, yet firm wording of which is no doubt being studied in Teheran.

Perhaps the representatives of a more moderate policy, which have the support of the Shah, will, in the interval of two months, receive a hearing, and, needless to add, the Anglo-Iranian Co. and the British Government will miss no opportunity to bring about a settlement, in spite of the Persian rejection of both the supplemental agreement and of the "fifty-fifty" proposal. The precedents set before the war by Mexico and, during the war, by Venezuela, make it necessary to approach the Persian oil question with the greatest care, and any settlement that might be reached would have to recognize the need for the company's participation in schemes for speedy economic and social improvements in Persia, beyond Abadan and Southern Persia, where it has already done a great deal. While the rulers of Persia must bear the brunt of the blame for the present plight of their land, they yet can point to the fact that important developments are, for instance, being carried out across the Gulf in Saudi Arabia, by U.S. oil companies. It seems that no peaceful developments can be assured unless the Anglo-Iranian Oil Co. follows suit.

Northern Rhodesia

No copper mining area can show progress in the way of production in the last few years comparable to that achieved by Northern Rhodesia. Last year the output reached 311,000 tons, nearly one-third of the output of the whole of the United States domestic production. The following table shows production in tons for the past five years:

1946	1947	1948	1949	1950
182,289	192,500	213,615	259,081	311,000

These results are all the more remarkable as they have been achieved by only four great mines, Mufulira, Nchanga, Nkana and Roan Antelope. Next to copper, though very far behind, comes Rhodesia Broken Hill, with an output, in 1949, of 13,945 tons of lead and 22,850 tons of zinc, but production in this instance has not been varied much recently. Rhodesia Broken Hill also obtained, as a by-product, 269 tons of V_2O_5, valued at £181,502 in 1949. As a by-product of copper refining, the production of cobalt is important. The 1949 output was 10,236 cwt. of metal valued at £645,273.

It is unfortunate, if inevitable, that official reports from the Mines' Departments of the various British Commonwealth countries, with their wealth of detail, often do not reach us for more than 12 months after the period with which they deal, and in these days of rapid change much may happen in the interval. Thus we received only last week the annual report of the Acting Chief Inspector of Mines, Mr. F. J. Ryeland, which is chiefly of interest for the details given in regard to the labour position. During 1949, the year under review, the supply of African labour was generally sufficient at the large mines, and the European labour supply adequate. At the end of the year there were employed 4,758 Europeans and 37,475 Africans, five big mines accounting for just over 98 per cent of the total labour force. Wage rates, which were the subject of considerable dispute last year, averaged, at the end of 1949, 64s. 9d. underground and 54s. 7d. on the surface per month. The wage bill for the industry in 1949 totalled just under £6,000,000 exclusive of just under £550,000 in bonuses. Income tax was nearly doubled at £5,009,555 against £2,481,900 in 1948. The fuel situation, of which a good deal was heard in the latter part of 1950, does not appear to have caused any difficulties during 1949. Waste heat gases supplied 50.3 per cent and coal 49.2 per cent of horsepower generated, only one-half per cent coming from wood.

In underground mining, there was a further increase in the use of long drill hole in stoping, for which the diamond drill was usually employed. In this way drilling is kept well ahead of blasting. The total footage drilled in the copper mines was 2,645,923 ft. compared with 1,635,853 in 1948. Fatalities in the mines were 3.51 per 1,000 Europeans and 1.96 per 1,000 natives. The most serious accident, responsible for the death of 14 natives, was due to the collision of a locomotive with a loaded explosives lorry. Largely due to this catastrophe, death from explosives accounted for 22 out of 67 fatalities.

The copper-belt is not immune from the miners' scourge, silicosis. Out of some 3,000 Europeans and 2,000 Africans examined during the year, 11 and 13, respectively, were new cases. None of the Africans had worked elsewhere than in Northern Rhodesia. Calcium chloride was used to consolidate floor dust, and flannel bag and coke filters were also installed. A Commission on silicosis sat during the year, but its report had not been considered by the Government when the year closed. Systematic dust sampling is carried out at the copper mines, and it is noted that the diamond drills produce much less dust than percussion drills.

Further Developments at Leadhills

The introduction of electricity to Leadhills in Lanarkshire, the second highest village in Scotland, in August of last year gave substance to the idea that the lead mining industry in that area might be revived. As mentioned in our issue of September 22 last, lead mines operated at Leadhills since the thirteenth century, but during the trade depression twenty years ago, when the price of lead dropped to £10 a ton, all work ceased in the lead mining industry.

The Dumfries and Galloway Development Association, which have made efforts to revive the industry for several years have just announced that there is a possibility of the old workings at Leadhills (Lanarkshire) and Wanlockhead (Dumfriesshire) being re-opened, and that they have succeeded in interesting a prominent mining company in the development of the area. At the present price of good soft foreign pig lead for March/April delivery at £136 per ton, duty paid, it is felt that the scheme has a good chance of paving its way. At the beginning of March, a Ministry of Supply official stated that a survey of the area had been made.

Australia

(From Our Own Correspondent)

Melbourne, February 28.

The fuel position in Australia has become very serious through the repudiation, by the Miners' Federation of a recent award of the Industrial Court, which, in order to combat the incessant stoppages of work in the collieries, introduced incentive payments to men who worked full time. The Federation has ordered a stoppage of one day per week in all mines to continue until the incentive payment provision is cancelled. The Commonwealth Government, very properly, intends to fight the issue, for the coal mining industry has been dominated far too long by the unions, under Communist control. Apart from the fact that steel production is now no more than 70 per cent of works capacity, through shortage of fuel, other output figures are significant, and clearly show the results of the policy of strangulation followed by the unions. In 1935, 22.6 per cent of coal won was mechanically cut and 0.2 per cent was mechanically loaded, the output per man-shift being 3.33 tons; in 1938, 28.4 per cent was mechanically cut and 6.5 per cent mechanically loaded, and output per man-shift was 3.51 tons. In 1949, the percentages of coal mechanically cut and loaded had increased to 36.0 and 30.6 respectively, but the output per man-shift had fallen to 2.91 tons. This adverse development has occurred despite great improvements in working and social conditions. Production of 12,790,000 tons of coal in 1950 has been acclaimed in some quarters as an achievement; but the fact is that this improved figure is due entirely to production by opencast mines, underground production remains at the low level at which Communist control keeps it. Estimated requirements for 1951 are 16,000,000 tons; resources, equipment, and development of the mines are capable of delivering this tonnage, but such a result is impossible while union domination continues.

POSITION OF TIN PRODUCERS

The position of tin producers has been emphasized recently to the Commonwealth Government and the crippling effect of the pegged price for tin has been stressed. The present controlled price for metal in Australia is £A.840 per ton, whereas the Australian equivalent price overseas exceeds £A.1,900 per ton. This country has to import several hundred tons of metal per year for domestic purposes, at the overseas price, *plus* freight and other charges, but the local tin producer continues to be most unfairly penalized. Lead and zinc producers have an exportable surplus of about two-thirds of the output, after meeting local requirements at a pegged price, which gives these industries a substantial profit, though by no means what they are entitled to.

Copper is in short supply and there is no export, but the price, as pegged, is about 10 per cent below world parity. The tin producer is, therefore, the worst situated of the base metal producers, and such price increases as have been granted merely compensate the increased cost of production and offer no incentive to increase production.

We are publishing a day earlier this week because of the Easter holidays and we will resume normal publication next week.

Mining Developments in Turkey

An interesting report on Economic and Commercial Conditions in Turkey by Mr. T. G. A. Muntz, O.B.E., formerly Commercial Counsellor to H.M. Embassy in Ankara, has recently been published for the Board of Trade by H.M.S.O. It is intended to cover the period from September, 1947, when the last report was issued, to April, 1950, and gives a very comprehensive and interesting survey of Turkey's economic development. In view of the important position occupied by Turkey in the Middle East, the following abstracts from Chapter V, dealing with Mining, are of more than usual interest, especially as Turkey's mineral wealth is to be exploited on an increasing scale with the aid of the E.C.A., and the Export-Import Bank, a development which is of great interest for U.K. contractors and suppliers of plant and equipment.

Except for coal, lignite, iron-ore and chromite, Turkey is not yet an important producer of minerals. The country has, in fact, not yet been completely surveyed from a geological point of view and it may be that more valuable deposits than those at present known will be discovered in time. The Mining Research and Explorations Institute (M.T.A.) completed a survey of Turkey's known mineral reserves during 1949, and, during 1950, was to have carried out further work on the more important deposits, concentrating particularly on the possibility of increased development of the lignite and iron-ore deposits.

In addition to coal and iron, Turkey intends to expand her chrome, antimony, copper and lead production and has submitted such a development programme to the O.E.E.C., supporting it with the claim that such development will not only earn dollars and foreign exchange for her own use, but will provide an exportable surplus which will, in turn, save other O.E.E.C. countries dollars.

Since it was felt by the Turkish authorities that private enterprise could not develop the country's minerals as the interests of the country required, the Eti Bank was created to deal with mining and power development. This bank has to-day an authorized capital of T.L.150,000,000, of which T.L.52,345,000 has been paid up; it employs about 40,000 workers and 3,500 officials. Under the 1950-51 budget proposals, it is to receive T.L.30,000,000 from the Ministry of Finance appropriation (as compared with about T.L.3,000,000 per annum during recent years) to increase its capital. This will be used principally for increased development at Zonguldak.

IRON-ORE

Practically all the production of iron-ore comes from the Eti Bank-controlled mines at Divrigi between Sivas and Erzurum, from which it must be transported about 700 miles by rail to the Karabük iron and steel works. Production has been increasing steadily during the last few years. In 1949 it was 218,043 tons (146,933 tons in 1947 and 167,820 tons in 1948), and it was hoped to reach 285,000 tons during 1950.

New equipment for stripping the overburden and for mining and crushing has been ordered with the help of E.R.P. funds, for which, during the 1949-50 aid year, $1,900,000 were allotted, and for which the Turkish Government has asked for a further $1,100,000 for the 1950-51 aid year. Further improvements needed include a larger aerial ropeway and power plant. One of the major difficulties is the length of haul to Karabük. Plans to reduce this by the construction of new railway lines are projected, but are unlikely to mature for some time. There is a large, but lower grade deposit of ore near Adapazari which is not at present being exploited.

INCREASING COPPER OUTPUT

Copper mining is a monopoly of the Eti Bank and, since the closing down of the Tuvarsam mine in 1945, has been concentrated at Ergani, Maden and Murgul-Hopa. The Maden mine is located on the road and railway from Diyarbekir to Elâzig, 20 kilometres south-east of Hazar Gölu. It has been worked intermittently since 2000 B.C., when it was discovered by the Assyrians. Production at Maden amounts at present to about 120,000 tons p.a. of ore suitable for furnaces, and up to 30,000 tons of fine ore. Production from the furnaces during 1949 was 11,283 tons of blister copper, of which 7,230 tons were exported. It was expected that 8,000 tons would be exported during 1950. The blister, which contains about 99 per cent copper, when refined in the U.S., yields about 12-15 grammes of gold and 150-200 grammes of silver per ton. Staff at this mine consists of 56 technicians, 77 administrative workers and 1,900 to 2,000 labourers, working in three shifts.

New equipment for the Murgul-Hopa mine, including concentration plant and furnaces, and a hydro-electric power station, is at present being installed by a U.K. firm, and should come into operation this year. Production is then expected to be about 12,000 to 14,000 tons of blister copper a year. The ore runs about 2½ per cent of copper against 9 per cent for ore from Ergani-Maden. The estimated life of the mine, however, is probably only about fifteen years.

IMPORTANT CHROMITE DEPOSITS

Chromite, or chromite oxide, is found in many districts throughout Turkey as lens-shaped deposits ranging from a few hundred tons to 100,000 tons or more. The richest deposits being worked at present are those at Güleman and Gaziantep. Most of the other producing areas, some of which show rich deposits (from 48 per cent of chromic oxide upwards) are located in the mountain ranges forming the rim rock, which includes the main central plateau of Anatolia. Much of the ore is low grade, but a large proportion of this poor ore is suitable for concentration, and some is suitable for refractory purposes. Deposits are generally found near or on the surface and concentration on a considerable scale is at present done by three companies, two of which use a wet process while at Güleman the third, the largest producer of concentrates, employs a dry process supplemented by a wet concentrating plant. A few other chrome producers use a primitive method of wet concentration on a very small scale. The total so produced amounts to a maximum of 3,000 tons.

The most important chrome production centres in Turkey are:

(a) Güleman.—Here a subsidiary company of the Eti Bank operates the richest mine in the country. This produces at present about 125,000 tons, of which approximately 60 per cent is lumpy. Completion of the installation of new concentrating plant, which took place in 1950, and the development of new deposits at Sori, should raise production to between 150,000 and 200,000 tons p.a. Almost the whole production goes to the U.S.A.

(b) Fethiye.—The Fethiye ore is mined by a company which has been financed by French mining interests, but is under some measure of control by the Eti Bank following the latter's loan of T.L.1,000,000. Production is about 25,000 tons of concentrates p.a. which, after the installation of new pumping equipment in certain mines, may be raised to about 40,000 tons p.a.

(c) Sazak and Marmaris.—The Turkish company which operates mines at these centres is directed by an Anglo-Scandinavian company through Swedish engineers in Turkey. Production is at present about 25,000 tons of concentrates p.a. This company's present activities in expanding its concession will probably lead in the near future to their taking second place only to the company operating the Güleman concession. All production goes at present to Sweden and the U.S.A.

After the feverish activity of the war years, during which large stocks of chrome, bought under pre-emptive arrangements, were accumulated in Turkey, production decreased in the immediate post-war period, but the disposal of the war-accumulated stocks, together with the stockpiling programme of the U.S. Government, again stimulated production, which now greatly exceeds the output during the war years. The Eti Bank has stated that production in 1949 was 414,706 tons (285,353 tons in 1948) of which the Bank's mines produced 172,689 tons of lumpy and 24,693 tons of fine or low-grade ore. Production by private mines totalled 217,324 tons.

LEAD

Production of lead-zinc ores during 1949 was, according to statistics obtained from the Eti Bank, 697 tons of zinciferous and 420 tons of argentiferous ore. There are several known deposits, the principal ones being at Keban, Bolkardag, Balya and Anamur.

The Keban lead mine in the Elâzig district is reported to have known reserves amounting to some 150,000 tons of ore which contain about 10 per cent lead. There is a concentrating plant at this mine. The Bolkardag mine in the Mersin district is reported to have known reserves totalling some 300,000 tons of ore of a complex nature, 8 per cent lead with some zinc and some gold. It was originally intended to set up a smelting plant near Iskenderun or Mersin to receive concentrates from these two mines, but the pre-war price of lead was such that nothing was done to develop the mines or erecting the plant. The Turkish authorities have, however, asked for $925,000 during the 1950-51 aid year to develop these mines. The Balya mines were worked by a French-Spanish company which ceased operations about 1942. The old workings are now flooded. There are still reserves of ore which, with the higher post-war prices for lead, might well be a paying proposition and consideration is being given to working these deposits. The Anamur mine was idle for several years, but has recently been worked again. However, it is thought to be approaching exhaustion.

Boracite mines at Sultan Cayirli near Balikesir, are operated by a U.K. company. Exports in 1948 and 1949 were 6,063 tons and 8,511 tons, respectively, mostly to the U.K., France and Poland.

MANGANESE

Deposits of manganese are worked in two main areas of Turkey. The larger area is in the hills between Eskisehir and the Western coast. Almost all the ore is of low grade (35 to 40 per cent) and fairly hard. The principal mines are those near Edremid (40 per cent), Balikesir (42 per cent to 45 per cent) and Baliköy (35 per cent to 40 per cent). The other area is on the Black Sea coast in the Zonguldak-Eregli district, where two of the largest mines are situated. There are considerable quantities of ore, some of high grade, but unfortunately running from 70 to 90 per cent of fines owing to the friability of the ore.

Production has gone up, largely owing to increased consumption at Karabük (formerly 4,000 tons a year and now possibly 7,000 tons or more) and to the lifting of restrictions on extraction. Some British firms have sent out representatives recently to inspect mines in the Eskisehir-Balikesir area, but nothing has, at the time the survey was written, resulted from their surveys. Present production is between 8,000 and 10,000 tons p.a., mostly of 40 per cent quality.

MAGNESITE

Mining is in private hands. Production was 4,870 tons in 1949, principally from the deposits on the south coast near Fethiye, and in the mountains near Eskisehir and Kütahya.

MISCELLANEOUS MINERALS

Sulphur.—There is only one source of sulphur, owned by the Eti Bank, at Keciburlu near Lake Burdur. The raw material is rhyolite, the method of extraction being similar to that used elsewhere, *i.e.*, to subject the ore to a pressure of several atmospheres under steam. Production has been reduced recently as a result of a change from one deposit to another and was 2,900 tons in 1949. It was expected to reach 3,000 tons during 1950.

Production is used locally and does not meet the demand, with the result that Turkey is a net importer, her sources of supply being principally the U.S. and Italy.

Asbestos.—Asbestos is found in various parts of Turkey, but production is at present very small and exports were only 378 tons in 1949. There is a deposit of good quality in the Taurus Mountains north of Tarsus, but little or no work has yet been done to bring it into production.

Antimony.—Antimony ore is found near Balikesir and near Turhal. Production in 1947 was 273 tons, 1,316 tons in 1948 and 1,140 tons in 1949. The Turkish authorities have asked for $313,000 during the 1950-51 aid year to develop these deposits and estimate that production could be raised to 2,650 tons (of 65 per cent antimony concentrates) which would earn $2,500,000 p.a. in foreign exchange.

Mercury.—Mercury is to be found at Karaburnu Ahirli, near Izmir, but production is very small, being no more than about 27 flasks in 1948. In 1949 production was considerably smaller due to a fire which destroyed the only factory producing finished mercury.

BITUMINOUS COAL

Bituminous coal suitable for coking is found on the Black Sea coast between Ergli and Asmara, in difficult broken formations. The principal port for shipments is Zonguldak. Production (in tons) amounted to 4,182,705 in 1949, 4,022,818 in 1948 and 3,946,245 in 1947. Though production had been increasing slowly, it has not kept pace with industrial or domestic demand. The authorities have, therefore, in addition to trying to increase the production of bituminous coal, taken steps to increase the production and use of lignite. Total production of lignite in 1949 was 1,236,668 tons. As a result of the increased demand for domestic consumption during recent years, exports have ceased since 1941.

Efforts to increase production and reduce costs were seriously handicapped by the war, but are now making better progress. A new power station, built by U.K. firms, came into operation at the end of 1948. New shafts are being sunk by another U.K. firm and the contract for a fundamental re-making and improving of the port of Zonguldak has been let to a Netherlands firm. A contract has been signed between the Eti Bank and two U.S. firms to advise and supervise this work. The Turkish authorities have stated that they intend to utilize approximately $50,000,000 of the foreign aid which they hope to receive up to 1952 for the development at Zonguldak. These improvements are to include the construction of two washing plants at Zonguldak and Catalagzi, with an hourly capacity of 750 and 500 tons, respectively, the provision of 8 kilometres of new railway between the various plants, and the improvement of the port at Zonguldak to permit the loading of 10,000 tons of coal per day. It is hoped by these various means to raise the production of coal to 3,720,000 tons p.a. by 1952. A new coal depot with the most modern equipment has been built by a U.K. firm at Istanbul. At present, handling capacity of this depot is beyond the capacity of the port and ships from Zonguldak.

Trackless Mining at St. Joseph Lead Co.

By R. T. MURRILL, General Mine Superintendent and PETER B. NALLE, Mine Engineer,
St. Joseph Lead Co., Bonne Terre, Mo.

An interesting paper on the subject "Trackless Mechanized Mining of the St. Joseph Lead Co., in the South-East Missouri Operations" was presented by Messrs. R. T. Murrill and Peter B. Nalle at the 1950 Metal Mining Convention held at Salt Lake City, Utah, August 28-31, 1950. It gives details of the equipment used, such as Joy loaders, hard rock Jumbos, portable ramps, scrapers, shuttle cars, and Diesel trucks; in addition, it describes the changes in mining methods required to cope with some of the special problems that arise as a result of the introduction of an increased use of trackless mining.

A review of trackless mining in this well-known U.S. lead producing company could cover the work of many years; it might date back to the time when the mechanical shovelling machine was introduced into the mines during World War I; since from that date begins St. Joe's programme of mechanization, which, by gradual steps, has resulted in the complete mechanization, in some form, of drilling, loading and hauling. All loaders then and to-day, were mounted on crawler traction treads: this might be considered as the first step in trackless mining.

Ore bodies in the district are adaptable to either the track or trackless mining methods. Haulage levels are maintained near the bottom of the general trends of the ore bodies. Upper levels are reached by raises or steeply connecting drifts. One of the problems encountered is the discontinuity of the ore bodies. Unlike coal or limestone mines, it has been impossible to delineate the ore bodies in advance of mining. Rough outlines and elevations of the ore are obtained by diamond drilling, but until the actual mining is finished, the shape of the ore body is unknown.

In a normal stope, ground is broken by drilling slab holes with a post mounted, wet machine. In high ground, a breast line is advanced ahead of a bluff, which is then broken by lifters and splitters. All stopes can be classed as room and pillar stopes. No timber is used and bad back is supported by roof bolts and channel irons. Pillar spacing varies from 18 to 40 ft. in the clear. The average pillar diameter is about 15 ft. in the present operations.

TRACKLESS LOADERS

In a regular stope, heading ore is loaded directly into mine cars of 2.7-ton or 12.5-ton capacity by mechanical loaders. The largest proportion of mechanically loaded ore is handled by St. Joe shovels. Developed by the St. Joseph Lead Co., they have proved satisfactory for over twenty-five years. They are electrically powered, boom type shovels with full revolving turntables, mounted on heavy crawler traction treads and weighing about fifteen tons each. Shovels of this type handle about 3,950,000 tons of ore per year. The cars are spotted at the shovel by gathering locomotives. When a train of ore has been loaded, a main line locomotive hauls the ore to one of the operating shafts in the district. The average haul from heading to shaft is about 2.2 miles.

The second step in trackless mechanization came with the advent of scrapers. With the complete conversion to the mechanical loading equipment by about 1930, it became necessary to find some method of loading ore in stopes that were above the main mine elevations. Such stopes were, in general, flat and of limited extent, not justifying either a new operating level or a long draft to gain the necessary elevation. The standard two or three drum scraper has provided a solution to the problem for many years and is economical for distances up to 250 ft. of drag.

The third step was made when the Rogers ramp—a portable carloading scraper machine—was introduced in 1947. The ramps are mounted on crawler treads and powered by air or electric motors. A 40 h.p., three drum hoist is mounted on the ramp and a 48 in. open hoe is used to drag the ore. These ramps stand about 7 ft. 6 in. high when knocked down for moving. When loading, 11 ft. of head room is required. About two or three moves per day are made and the ramps average about 150 tons of ore per shift. These ramps are generally considered satisfactory when operating in areas where long moves are not required and are consequently limited as to tonnage available.

A further development of this idea was brought out in 1949 by making a unit to operate in lower headroom and possibly be more portable. A standard St. Joe drift-cleaning railroad ramp was taken off its 24 in. gauge track chassis and mounted on a Joy, air powered, rubber tyred jumbo chassis. A 24 h.p. three drum hoist was used with a 54 in. hoe. This new unit is loading about 175 tons per shift, including its moving. Mounted on rubber tyres, it has several advantages for use in off-level stoping and in small isolated places. Moreover, it is simple in design, comparatively cheap in first cost and can be operated by the breaking crew.

In practically all cases, except on the two ramps mentioned above, scrapers are used not as an alternative to track, but as an expedient to make mining possible where the use of track was impracticable.

HARD ROCK JUMBOS

During the past fifteen years, various types of hard rock jumbos and drill mounting rigs have been tried in the area with indifferent success. Some were too bulky, others not rigid enough and most were mounted for use on tracks. Not until 1946, when the first crawler tread mounted jumbo was introduced into the Leadwood Mine, did the jumbo come into general use. The jumbo, of which there are now fourteen in operation, is one of the standard pieces of trackless mining equipment.

DIESEL POWERED TRUCKS

The first underground items of trackless haulage were Dart trucks with 100 h.p. Cummins Diesel engines, pulling Landis 10-ton semi-trailers. They operate very successfully when ample turning space is available and where too much backing is not required through long haulage drifts. In 1948 the trailer was changed to a dump body placed on the rear truck chassis; a standard Gar Wood 2½-ton with hydraulic lift.

The trucks have hauled 175,000 tons of ore to date on an average haul of 400 ft. with a maximum haul of 700 ft. They have operated against 6 per cent grades. Standard, readily obtainable parts are used for repairs. About six tons constitutes a pay load. One disadvantage of the trucks is that 9 ft. of clearance is required for loading and 11 ft. is required above the car or point of discharge for dumping. Further tests with Diesel driven equipment are planned for well-ventilated sections of the mines.

The introduction of the shuttle car in 1947 was an attempt to eliminate most of the tracks in the operating headings.

By necessity, track in a stope ties up a certain amount of ore which is used for ballast and cover to keep the track from being blown out during blasting. It is troublesome to reclaim this ore and to remove the rail when the stope is finished. It was hoped that the introduction of trackless haulage equipment would give the mine foremen better opportunity to practise more selective mining and that it would give operators greater freedom in choice of haulage grade and direction so that the vagaries of the ore could be followed. However, movements of ore over long distances to the hoisting shafts will still be handled by rail. The long hauls for the main line haulage system are the result of the consolidation of the milling and hoisting facilities in the area and with the exception of certain areas and outlying mines, trackless mining was never intended to replace the main line haulage system.

The size of the present standard haulage drift in the area is ample for moving the shuttle cars. However, in the older sections of the mines, many drifts are of inadequate cross-section and have curves which were not laid out for the equipment. Many haulage drifts have large water ditches and others have pipes and power lines in close places. These factors hinder the rapid movement of shuttle cars from stope to stope; a feature which is vital to the production of the necessary tonnage from each unit if it must serve several stopes. Thus, it became apparent early that a stope or group of stopes accessible to the shuttle car must have a fairly long life; otherwise, the cost and time required to dismantle, move and re-assemble the shuttle car could not be justified.

Mine No. 20 is an all trackless operation and uses one Joy loader and one St. Joe shovel in conjunction with two Joy shuttle cars. For long hauls two trolley poles are used, one for the ground and one for the hot wire, in conjunction with standard 4/0 trolley wire on hangers. For short hauls and travel in the headings the reel on the car is used. The shift from reel to trolley is made by unplugging the Miller plug at the end of the reel cable and putting up the poles. The haulage grades are kept to 2 per cent or 3 per cent against the load on long runs, but short runs have been made up to 6 per cent. The average length of haul has been about 500 ft. and the maximum haul was 1,000 ft. In order to move the loaders for the long distances, a rubber-tyred, two wheel trailer takes the place of the shovel truck normally used on mine track. This trailer is pulled by the shuttle car and its use saves the travel mechanism on the equipment and shortens the moving time. The tonnage hauled from 1947 to date is 311,610 tons. The mine manages its own minor maintenance problems, and is 28 miles from the main source of supplies and the shops.

JOY LOADERS

Mention has been made above of the Joy loaders, which were brought into the mine in 1947 and 1948. These loaders and the shuttle cars brought coal handling equipment into the metal mine. The Joy loader in use is the 18 h.p.—a mobile crawler-mounted continuous loader. It is powered by a 50 h.p. A.C. motor and has the following overall dimensions when ready for travel: height 63½ in.; length 25 ft. 4½ in.; width 6 ft. 10 in.; weight 15 tons. It travels at speeds of 63 ft. and 210 ft. per minute. These loaders, like any piece of newly developed equipment, have presented a number of problems which now are well on the way toward correction, *e.g.*: maintenance, due to the handling of hard and abrasive material; design, requiring stronger and simpler construction; personnel, due to the inexperience of men chosen to operate machines of greater precision type than customarily used in mines, and finally problems of the mining system, which had to be modified to suit the machines.

These Joy loaders are especially convenient for loading in low ground, on steep grades and in narrow headings. Thirteen of them are now in use in the mines in various capacities of stope and development work.

Much of the trackless equipment must be moved daily from heading to heading, from mine to mine, and from mine to shops. The distance of move varies from a few hundred feet to several miles at times. For this purpose track mounted transfer trucks are provided. They are built to take up as little head room as possible, so that when moving equipment through drifts, the danger of brushing the trolley wire is minimized. In the completely trackless mines, the moving of equipment is accomplished by use of rubber-tyred transfer cars.

CHANGING MINING METHODS

Most of the trackless equipment fits easily into the normal mining operations, but it has been necessary to try several methods in adapting the large shuttle cars. To use a shuttle car most successfully requires its placement either in one large stope or in a group of stopes so situated that the car can reach them all readily. Test areas are being operated at present to determine the amount of change necessary in the mining system to produce the greatest efficiency from trackless equipment.

The limiting factor in loading operations in the Lead Belt has been the ore breaking ability of the drillmen in the headings. Under the regular system a good driller can break as much as 110 tons per shift under some conditions, but the overall average for the Lead Belt is about 65 tons per shift. The average heading can be drilled and shot by the average drillman until about 200 tons are broken and piled in his heading, then the heading must be cleaned before any more drilling can be done. Thus, to maintain a loader at maximum efficiency, a large number of headings must be provided in order that the loading unit always has broken ore ahead of it and that the driller always has free faces in which to drill. An ideal cycle would call for twelve headings in the low ground, from eight to ten feet high, but such a set-up is not generally available in the area. Some help is obtained by use of the latest drill jumbo round which blocks out a heading in a shorter time and thereby reduces the number of headings required per loader unit. Blasting can be done only at the end of an operating shift. Careful supervision and layout of the stopes are required to prevent excessive ore dilution.

The problem of maintaining high production rate in a limited area and still practise selective mining has not been completely solved. Only the most careful supervision, combined with the correct preliminary development and planning, will permit the operation to succeed.

One of the company's newly opened outlying mines, the Doe Run Mine, is a good example of the proper application of a system for using the jumbo, Joy loader, shuttle car combination. Here the ore is of better than average grade, the ore bodies are large and high, the plan of mining was laid out well in advance of mining operations and supervision is excellent.

TRACKLESS DEVELOPMENT

As to the general manner of laying out development, there is little difference between track and trackless mining: the main exception is that in trackless mining some additional footage of drift must be driven for a tail track on which to pull the loaded cars past the loading ramp station. When opening up a new ore body for either system of mining, the usual practice is to drive a drift to cut the lowest recorded pay run elevation in the ore body, in order to have the stope work up grade. A greater freedom in

choice of grade and degree of curvature is allowed in trackless development, but an effort is still made to limit grades and curves. Drifts for trackless development are cut wider, 11 or 12 ft. instead of 10 ft., than for tracked development. Two general methods are available for cutting drift in most mines. The drift may be cut in the standard manner using any of the track mounted loading machines, such as Eimcos, Conways or scraper ramps. In this case the track is removed after the drift is complete. The second method is to make the drift trackless from the start. Trackless equipment currently available for cutting drift are: Joy loader and shuttle car; portable ramp and shuttle car, and stationary slusher hoist and scraper. The Joy loader and portable ramp are very satisfactory for cutting drift. Perhaps the only complaint is that a unit capable of loading operating ore is tied up handling development rock. For drifts being cut on a three shift basis, the increased loading rate has proved an advantage in giving more time for ventilation between rounds. The stationary hoist is used for cutting drifts from trackless stopes when a Joy loader or ramp is not available. The method is not entirely satisfactory, since only straight drifts may be cut economically and the maximum practical length is about 300 ft. The rock disposal problem becomes acute in long drifts if there is not a loading unit and shuttle car nearby to remove the rock occasionally. Also, it frequently happens that when the rock is piled in the stope, it is difficult to keep the waste and ore separated.

The inability to do extensive development work from trackless stopes operated with St. Joe Shovels and from stopes from which the Joy loader has been removed is one of the difficulties encountered in development for trackless mining.

A great deal of ingenuity has been displayed by the men in moving their heavy equipment through the old workings and up and down raises to start development in inaccessible areas. Since the loader operates on A.C. and the shuttle car on D.C., five wires must be carried at times for power lines. An air line also must often follow when moving the cars through the old mines in order to drill sling holes for hoist blocks. Cars and loaders have been helped up inclines with grades as steep as 50 per cent and over 120 ft. in length.

CONCLUSIONS

The switch from track to trackless mining has not been a cure-all for the problems of the industry, nor has it done away with the necessity for careful planning; in fact, the concentration of equipment and productivity in one small area requires a higher degree of co-ordination and planning. The greatest gain is made by the complete removal from the operating stopes of the heading track and its attendant problems. Trackless stopes can without a doubt produce more tonnage per unit and per day from small ore bodies than the previous conventional stope methods. Some of the areas in which high production rates were planned are gradually coming much closer to their goal without an undue ore dilution. In development work the rubber-tyred ramp and the Joy loader in conjunction with shuttle cars have proved to be excellent drifting combinations.

Because of the many factors involved in the installation of trackless equipment and because of the relatively short time in operation, it is difficult to make a satisfactory cost comparison between the two mining systems. However, it may be said with confidence that trackless mining in one form or another has become an integral part of the Southeast Missouri Lead Belt operations.

REVIEWS

The British Coal Industry.—*By H. Townshend-Rose.* 1950, *London: George Allen and Unwin.* (*National Board Series*). *Pp.* 162; *Illustr.* 4; 5¾ x 8½ *in. Price* 12*s.* 6*d. net.*

The author, a solicitor in the Legal Department of the National Coal Board, has made an attempt to give a simple account of the way in which the British coal industry was nationalized and of the N.C.B.: it was his aim to describe —not to criticize. An introductory chapter, Background to Nationalization, gives the reader a useful history of the industry's development in the inter-war years. This is followed by two chapters devoted respectively to the Process of Nationalization and to the New Organization. Chapter Four contains a description of the mining of coal, and includes particulars of such modern techniques as horizon mining, skip winding, and underground gasification. The book informs the reader also about coal marketing at home and abroad, grading, prices, labour matters, absenteeism and welfare and safety problems. The capital structure of the nationalized industry, and the financial results achieved are dealt with in the concluding chapter.

Guides to Africa

In view of the increasingly important rôle played both in international and in economic affairs by Africa, south of the Sahara, a cordial welcome will be extended to the recent publication of the 1951 edition of the *Year Book and Guide to Southern Africa and East Africa*, respectively, both edited for the Union Castle Mail Steamship Co. Ltd., by A. Gordon Brown, F.R.G.S., and published in London by Robert Hale Ltd.

The scope of these guides, which have proved to be most faithful companions to many travellers, businessmen and intending settlers, as well as an invaluable source of information to teachers and students—is continually being extended; they give in addition to the usual travel information and historical sketches, much detailed information on, *inter alia*, industrial developments, imports and exports, a climatic survey, articles on farming and labour conditions, etc. The volume on Southern Africa (Price 9s. 4d., post free) contains over 800 pages, an atlas of 48 coloured maps, route diagrams and town plans, and covers the Union of South Africa, Northern and Southern Rhodesia, South-West Africa, Angola (the southern part) and Mozambique, Basutoland, Bechuanaland and Swaziland. The section devoted to the Union of South Africa contains, needless to add, a chapter on minerals and mining containing numerous tables. There is a special chapter on gold mining with a flow-sheet demonstrating the processes through which the ore passes between the shaft and the refinery.

The Year Book and Guide to East Africa (price 6s. 6d., post free) contains over 400 pages, including many plans and diagrams as well as a 16-page atlas and a folding map of Africa, both by John Bartholomew & Son, Ltd. It deals in detail with Kenya, Uganda, Tanganyika, Zanzibar, Nyasaland, Portuguese East Africa, the Sudan and Mauritius; it also covers less fully, Egypt, Eritrea, the Somaliland Protectorate, French Somaliland, Somalia, Ethiopia, the Belgian Congo, Madagascar and Reunion. The whole book has been carefully revised since the last edition, involving many hundreds of alterations.

Publications received from the Ministry of Fuel and Power:

Report of H.M. Principal Electrical Inspector of Mines for the Year 1949.—*H.M.S.O. Price* 1*s. net.*

Report of H.M. Chief Inspector of Mines 1949 (*under the Coal Mines Act*, 1911).—*H.M.S.O. Price* 1*s.* 6*d. net.*

Support at Roadheads—Safety Pamphlet No. 22.—*H.M.S.O. Price* 3*d. net.*

Colliery Accident Funds (*Great Britain*).—*H.M.S.O. Price* 4*d. net.*

Machinery & Equipment

The Climax Tractor Drill

The Climax Tractor Drill, manufactured by the Climax Rock Drill and Engineering Works Ltd., Carn Brea, Cornwall, is described as a new and versatile rig which is ideally suited for deep-hole drilling. It consists of a standard Fordson Major tractor, fitted with hydraulically controlled parallel linkage, one end of which supports a universal mounting for the Climax Drifter. When a hole is to be put in, the tractor drill is driven into position near

The Climax Tractor Drill for deep-hole drilling at all angles

the face, and the weight is taken off the front wheels by lowering two hydraulic jacks. The drifter can be raised or lowered as necessary by the hydraulically operated parallel linkage which—like the front jacks—is controlled from the tractor driver's position. Mounting arrangements for the drifter are such that it can drill in any position and in any direction, including vertically downwards and on either side at right angles to the tractor centre line. The rig can move from one position to another in the minimum of time, towing a portable compressor if necessary. It is claimed to be eminently suitable for drilling deep holes up to 60 ft. It can be operated efficiently by two men only.

The drifter mounting is very easily and quickly removed, and the tractor can then be used for levelling, shovelling, or for general haulage work.

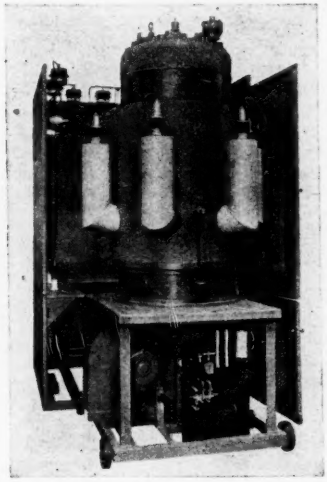
Developments in the Design of Pumpless Air-cooled Steel Tank Rectifiers

The production of the pumpless, air-cooled steel tank rectifier by The General Electric Co., Ltd., eighteen years ago, still remains one of the most outstanding achievements in the conversion of electrical energy. The work involved in its design and construction was undertaken at the company's Witton works, where experimental production began in 1933. As was anticipated, it met with immediate success, and not long afterwards equipments were in operation under the most varying conditions in all parts of the world.

To-day, this form of rectifier is manufactured in sizes corresponding to a normal current range of 350 to 1,250 amp. per cylinder for D.C. voltages up to 800 volts, while rectifiers for voltages of 1,500 and 3,000 volts are produced with outputs of 1,000 and 1,500 kW. in single units. Extra high voltage types have also been developed. All ratings are based on a 125 per cent load for two hours, and progressively heavier overloads up to many times full load for a few seconds.

It is usual for the complete equipment to be mounted in a sheet steel cubicle, which, in the earlier designs, was constructed from steelplate of comparatively heavy section bolted or welded to an angle iron structure of ample strength to carry the weight of the rectifier cylinder and its auxiliaries. In modern equipments, the rectifier and its associated auxiliaries are mounted on a separate platform, which is supported by angle irons secured to the foundation channels, so that no weight is transmitted to the cubicle itself. Hence, a lighter form of construction becomes practicable, as the cubicle now serves mainly to prevent accidental contact with "live" rectifiers and to contribute to the control of the flow of cooling air over the rectifier cylinder. This has made possible improvements in the construction and appearance of the cubicles, which are now built from prefabricated steel panels.

With the advent of heavy current ratings, and consequently larger and heavier cylinders, the question of handling becomes increasingly important, particularly where no crane facilities exist or head room is limited. Therefore, in order to simplify installation, inspection and maintenance, the design has been modified to incorporate drawout features, the platform which supports the rectifier cylinder forming the top of a removable truck. The connections between the truck and the cubicle are arranged so as to facilitate withdrawal. A light removable pressed steel lintel fits across the top of the cubicle when the rectifier is in its service position. The cubicle doors close against this lintel and are held shut by bolts operated from the door handles, slots being provided in the lintel, truck platform and bottom channel. The centre of gravity of the complete truck assembly is well below the bottom of the anode arms so that the truck is perfectly stable and



A 1,250 amp. G.E.C. pumpless air-cooled steel tank rectifier

can be moved easily on a smooth floor. Where necessary, rectifier cylinders can be off-loaded from the lorry on to their trucks and wheeled into position in the cubicles.

Selayang Rehabilitates its Plant and Machinery

Selayang Tin Dredging, the Malayan tin producer, continues to rehabilitate its plant and machinery with good results. During the year to the end of September last, major renewals and repairs effected included the installation of a Bellis & Morcom engine, complete with a new high pressure Mirrlees pumping unit and oil separator: also a magnetic separator and a Holman air compressor have been purchased.

Metals, Minerals and Alloys

The International Materials Conference groups in Washington to study sulphur, tungsten and molybdenum; nickel and cobalt; copper, zinc and lead; are now in session but the international tin conference does not seem to be making much progress.

The N.P.A. has placed under complete allocation columbium and tantalum, and are reducing the amounts which may be used in stainless steel products.

India has prohibited exports of all virgin metals, semi-manufactures of non-ferrous metals and alloys, non-ferrous metals alloys, copper, lead, antimony and tin concentrates, scrap and all imported metal items. The Government is anxious that India should be included in the International Commodity Group for non-ferrous metals now sitting in Washington.

Copper.—In the U.S. the copper situation has become more tense, with smelters complaining that foreign cupriferous material is being diverted to German and Japanese refineries, as the ceiling price prevents domestic copper smelters from successful competition. The output of refined copper in March is expected to be some 6,000 s.tons down, with further reduction in April. The competitive price in the open market is put at 43c. per lb. as compared with the official price of 24½c. The placing of defence orders is increasing more rapidly and they are now estimated at 20-25 per cent of production, and this of course, is adding to the squeeze, but a decision to use steel for small arms shell cases should be a considerable relief. The output of the A.S. and R. Company last year was 474,671 s.tons compared with 407,795 s.tons in 1949. Earnings were $42,718,823 or not far from double those of the previous year. Higher prices and greatly stimulated demand made profitable the sale of material accumulated during 1949.

The chairman of the Messina Copper said at a meeting in Johannesburg last week that the opening up of new mines at Artonvilla, about four miles to the ast of Messina, was proceeding satisfactorily and a prospect in Southern Rhodesia was promising, and would, it was hoped, justify operation on a commercial scale. Exports of fire-refined and blister copper from the Union of South Africa in the first nine months of the year totalled 27,579 s.tons compared with 22,235 s.tons for the same period in 1949.

Lead.—Similar complaints of successful foreign competition are heard from United States process plants to those in regard to copper, and smelters are finding earlier estimates of supply were too high. Consequently, allocations for March are being reduced, and the April outlook is no better. There has been a strong demand for exports with offerings scarce at + 20c. per lb. f.a.s. Gulf Ports. Domestic consumption in the U.S. last year increased by 27 per cent to 1,214,713 s.tons (957,674 tons in 1949). The A.S. and R. produced last year 578,327 s.tons (529,395 in 1949). The diversion of foreign lead supplies from the U.S. is underlined by the steep drop in January imports of refined to 11,188 s.tons from 50,274 tons in December, and were the lowest for some 18 months.

Tin.—Last week the N.P.A. announced that all domestic users of tin metal would be subject to allocation control from May 1 next; it also designated the R.F.C. as the sole importer of tin. All transactions made prior to March 12 may be completed provided the N.P.A. receive particulars on or before the present week-end. In the second quarter allocations will be increased from the previous percentages to 95 per cent of the base period—the first half of 1950—but hot-dipped plate will not be cut in that quarter. Much confusion was caused in the New York market by contradictory statements from official quarters which left traders uncertain as to what was the official price under the new regime. This, for the present at any rate, appears to be $1.34. So far the Singapore market has gone on its own way and has risen, at any rate, temporarily. The latest London and Straits quotations are given below. Imports of tin concentrates into the Straits in February were 1,045 tons: Thailand 686 tons, Burma 242 tons, Indonesia 79 tons, Indo-China 15 tons, miscellaneous 23 tons. Fears are expressed in Malaya that output, more particularly from the dredges, may be cut substantially in the next few months owing to power shortage, and even if dredges do not close down that they must work shorter hours. The Malayan railways are said to be converting some of their locomotives from coal to oil burning, but dredges have not got the necessary steel or storage tanks for any early conversion.

As bearing on the increased demand for tin on the Continent of late, it is interesting to note that Switzerland imported 113 tons in January and this figure had risen to 426 tons last month; a year previously the figure had been 56 tons. Last week an agreement under the Point Four Scheme was reached between Bolivia and the United States, mainly directed to improvement in food production and transportation. The terms of the new tin sale agreement are still withheld.

Zinc.—Advices from the United States are of increasing tightness of zinc owing largely to shortage of concentrates. Export zinc is quoted at 27c. per lb. and upwards f.a.s. Gulf Ports. The net profit of the New Jersey Zinc Co. last year is reported at $10,024,294 against $4,980,956 in 1949. U.S. zinc consumption last year totalled 947,365 s.tons (711,841 s.tons in 1949). The increases were general in all branches of consumption.

Aluminium.—It is reported from Canada that earlier plans for the establishment of an aluminium plant in West Africa to supply the sterling area have been abandoned owing to political conditions in the Gold Coast, and that Britain will now look to Canada, presumably Alcan, for its future enlarged requirements.

The situation in West Germany is showing improvement. Current production is put at 5,000-6,000 tonnes a month with consumption estimated at between 6,000 and 6,500 tonnes. Bauxite contracts with Greece, Yugoslavia and France for the necessary raw material are now assured, and West Germany is expected to be able to meet her entire aluminium requirements from domestic smelting works. In Switzerland the aluminium position is said to be quite comfortable.

Bismuth.—The United States Government has imposed fresh controls on bismuth used for the production of precision dies, bearing metals, low melting point alloys and solders and steel tempering baths, as well as pharmaceutical and dental requirements. All persons holding, controlling or shipping more than 100 lb. a month have to file monthly reports to the N.P.A. and allocate 20 per cent to an N.P.A. reserve.

Manganese.—South Africa has banned the export of manganese ore except under permit. Exports for the first nine months of last year were 581,181 s.tons as compared with 545,669 s.tons in the same period of 1949.

Sulphur.—No confirmation has yet been received of an additional U.S. allocation of 20,000 tons to Great Britain for the first quarter of the year and the possibility of the President of the Board of Trade flying to the United States during the Easter recess have been again revived. The B.O.T. has prepared an allocations scheme but further advices from America are awaited before putting it into operation. Crude sulphur will be subject to allocation in the United States after April 1.

Tungsten.—In the wolfram market stalemate has continued. Holders of concentrates still think in terms of 600s. per unit c.i.f., but speculators and merchants around 500s. There is perhaps, however, a slightly steadier tone and the market might be called 520s./540s. per unit c.i.f.,

but buyers generally are not interested at this price. This figure begins to get within measurable distance of the U.S. ceiling price of 520s. c.i.f.

Portuguese exports in January were 189 tonnes, which serves to show how unsubstantial were reports of large shipments to the U.S.A. Our Portuguese correspondent reports complete confusion and often panic reigning there with the economic reactions likely to be far-reaching. Many exporters last week were quoting the equivalent of Esc.153 f.o.b. to try and liquidate the large stocks held, but without any response from importers. Many "mines" are said to have stopped working altogether. Last year's Portuguese production is given as 2,199 tonnes and exports 3,206 tonnes, suggesting that something like 1,000 tonnes of extraneous material has been exported.

Uranium.—The chairman of the Atomic Energy Commission stated in Washington last week that the Belgian Congo is still the principal source of uranium ores. But the United States last year displaced Canada as the second largest producer. The Vanadium Corporation is now operating its Uravan plant at capacity. It is reported from Sinkiang that the Russians are mining uranium ore in that Province.

The London Metal Market

(From Our Metal Exchange Correspondent)

It was not possible to discuss in the last article the very wide backwardation existing at that time, namely, £280 on March 15. This very wide margin was brought about by a series of factors which normally do not occur simultaneously, and the temporary nature of the situation was well demonstrated by the reduction in the backwardation to a little over £100 on the 16th; and it is confidently expected that this figure will not increase to any appreciable extent but that it should rather diminish in the future.

The world price structure of tin remains in a very unsettled state, with the R.F.C. still selling tin in America at $1.34 per lb., whilst the Singapore price has remained at approximately £100 per ton above this level on consistent buying from Continental sources, but it is thought that in the long run the American price will have to serve as a criterion for world prices. In the meantime the London market has an opportunity of remaining at a quotation which permits shipment of Straits tin to the U.K., and it is hoped that this state of affairs will exist for sufficiently long to enable the depleted stocks in the hands of the market to be built up again to a satisfactory tonnage from the point of view of market operations.

On Wednesday the official close on the tin market was: Settlement price £1,305, Cash Buyers £1,305, Sellers £1,310; Three months' Buyers £1,190, Sellers £1,195. In the afternoon the market was steady. Turnover for the day was 150 tons. Approximate turnover for the week (Fri-Wed.) was 475 tons.

The Eastern price on Wednesday morning was equivalent to £1,195 per ton c.i.f. Europe.

Iron and Steel

Shortages of various raw materials threatens to restrict production in a wide range of British industries throughout the year, but there are grounds for hope that in the iron and steel industry this difficulty will not be of long duration. Rising coal production encourages the expectation of an early restoration of the fuel cut, the dearth of shipping at the ore ports which has restricted the import of iron ore, may soon be rectified, and there is scope for the further improvement in the flow of scrap from home sources to offset the shrinkage in the imports of German material.

Much has been made of the scarcity of sheet steel. Revised allocations for the second quarter are equivalent to an overall reduction of 20 per cent as compared with a 15 per cent reduction for the current quarter. This, however is the only steel product the distribution of which is controlled, and users of all other categories of finished steel are faring not at all badly. Steel production has been maintained at a surprisingly high level having regard to all the difficulties, and if there be no prolonged delay in expanding supplies of raw materials, the deterioration in production may not be pronounced.

Of course, the majority of steel users are clamouring for supplies. They have been forewarned of a possible decline in production, and are well aware that as the year progresses, the development of the defence programme will impose heavier demands on the steel industry. Furthermore, apprehensions of another rise in prices provide an incentive to speculative buying. Hence the immediate home demand for steel is very extensive, and has involved the continuance of the voluntary restriction of exports.

Generally, the steel makers are still turning out impressive tonnages of plates sections and bars and are fairly confident of being able to cope with all home requirements without any serious curtailment of exports. That view is supported by the fact that a fair volume of new overseas orders have been booked by ship builders, electrical engineers, wagon and locomotive builders.

Pig iron constitutes a serious bottleneck. Throughout the post-war years pig iron production has expanded much more slowly than steel, reflecting the increased use of scrap. But scrap is becoming scarce now that most of the war material has been used up. Unfortunately, blast furnacemen are unable to respond to the call for increased outputs of pig iron until more fuel and ore is available, and in consequence deliveries to the foundries are curtailed. The position would not be so bad if reserve stocks had not been depleted. But these have also been run down almost to vanishing point and short deliveries now threaten to restrict foundrymen's activities.

Re-rollers have very healthy order books and near record outputs could be achieved with a more plentiful supply of steel semis. It is chiefly due to the sharp contraction in the imports of Continental material that conditions of scarcity persist. Recent deliveries of billets, blooms and slabs must to a lesser extent of sheet bars also have been below requirements and users are now very glad to accept defectives as well as primes, whilst an active demand has developed for re-rolling scrap.

Tinplate.—Conditions in the tinplate industry show little marked change; but the manpower outlook has slightly improved with the employment of new recruits from Italy. Production in January averaged 15,200 tons per week compared with the 1950 weekly average of 14,700 tons.

Coal

In the House of Commons on Tuesday the Minister of Fuel stated that between January 1 and March 10—a period of 10 weeks—the output of coal from pits had been 1,460,000 tons greater than in the corresponding period last year, and argued that on the basis of its present improved productivity the industry could achieve the Attlee target of an additional 3,000,000 tons over the four months ended April next. The objective set by the Government assuming a stationary productivity rate, was a total of 71,200,000 tons for the four months if reckoned on the production of deep-mined only, but of 75,200,000 if reckoned on the combined output of deep-mined and open-cast coal. During the first five weeks however, production has averaged a weekly increase of 250,000 tons over that of a year ago, in spite of 11,000 fewer workers; and the dubious point in Mr. Noel-Baker's argument is what allowance has been made for the normal loss during the Easter holidays from authorized and unauthorized absenteeism.

Last year the loss of tonnage from these causes exceeded 1,300,000 tons; and it is quite possible it is this factor that will eventually determine whether or not the target was actually achieved. In any event all concerned are to be congratulated on a performance which has not only dispelled the supply anxieties of last November and December but vindicated expert confidence in the coalfields traditional output elasticity.

MARCH 21 PRICES

COPPER

Electrolytic	£202 0 0 d/d

TIN

(See Metal Notes above for Wednesday's Metal Exchange prices)

LEAD

Soft foreign, duty paid	£136 0 0 d/d
Soft empire, including secondary lead	£136 0 0 d/d
English lead	£137 10 0 d/d

ZINC

G.O.B. spelter, foreign, duty paid	£151 0 0 d/d
G.O.B. spelter, domestic	£151 0 0 d/d
Electrolytic and refined zinc	£155 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over	£360 per ton
Crude, 10 cwt. and over	£275 per ton

NICKEL

99.5% (home trade)	£406 per ton

OTHER METALS

Aluminium, £124 per ton.	Palladium (scrap), £8 oz.
Bismuth, 22s. 6d. lb.	Platinum, £27/£33 5s. nom.
Cadmium, 17s. 3d./18s. lb.	Rhodium, £45 oz.
Chromium, 5s. 3d. lb.	Ruthenium, £30 oz.
Cobalt, 15s. 6d. lb.	Quicksilver, £73 10s./£74 ex-warehouse.
Gold, 248s. f.oz.	Selenium, 25s. nom. per lb.
Iridium, £65 oz. nom.	Silver (bar), 78¼d. f.oz. spot and forward.
Magnesium, 1s. 6d. - 2s. lb. according to quantity.	Tellurium, 19s. lb.
Osmiridium, £35 oz. nom.	
Osmium, £70 oz. nom.	
Palladium, £8 10s. oz.	

ORES, ALLOYS, ETC.

Bismuth	40% 11s. per lb. c.i.f. 30% 9s. 6d.
Chrome Ore—	
Rhodesian Metallurgical (lumpy)	£11 per ton c.i.f.
„ „ (concentrates)	£11 per ton c.i.f.
„ „ Refractory	£10 12s. per ton c.i.f.
Baluchistan Metallurgical	£11 11s. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw	£10 - £11 d/d
Manganese, Best Indian	(Nominal)
Molybdenite (85% basis)	(Nominal)
Wolfram (65%), U.K	nom. subject to negotiation
Tungsten Metal Powder (for steel manufacture)	39s. 6d. nom. per lb. (home)
Ferro-tungsten	37s. 6d. nom. per lb. (home)
Carbide, 4-cwt. lots	£30 18s. 9d. per ton
Ferro-manganese, home	£32 3s. 7d. per ton
Ferro-manganese, export	Nom.
Brass Wire	2s. 2¾d.
Brass Tubes, solid drawn	1s. 9¾d.

Mining Men and Matters

Mr. L. B. Pfeil, director of Mond Nickel Co. Ltd. and head of the company's research and development department, has been elected a Fellow of the Royal Society.

Mr. J. Robert Van Pelt, mining engineer and research executive, of Columbus, Ohio, has been appointed president of the Montana School of Mines, at Butte.

W. E. Sinclair, M.I.M.M., consulting mining engineer, is leaving Johannesburg for East Africa and Rhodesia on professional business on March 27, and expects to be away for some weeks.

C. Tennant, Sons & Co., of New York, have announced the opening of its Pacific Coast office at 333, Montgomery Street, San Francisco 4, California. Mr. D. W. Delaney is the Pacific Coast manager. Cable address: "Tennant" San Francisco.

The Minister of Fuel and Power has approved the "Mining Examinations (Certificates of Competency) Rules, 1951" which will come into effect on April 1, 1951. The Rules have been made by the Mining Qualifications Board, the body responsible for the conduct of these statutory examinations. Copies of these Rules, price 2d. net, may be purchased from H.M.S.O. or through any bookseller.

Business Items

Swiss Industries Fair.—The 35th Swiss Industries Fair will be held at Basle from April 7 to 17, 1951.

Colton Electrical Equipment Co. has announced that as from May 1, 1951, its new address will be Cranham Hall Works, Moor Lane, Cranham, Upminster, Essex. Telephone: Upminster 4454.

Newman Industries, Ltd., of Yate, Bristol, have announced that they have now been appointed sole selling agents for the U.K. for Franco Tosi and Sisma Diesel engines.

The National Bank of India opened a branch at Fort Portal, Uganda, on March 16, 1951.

S. Rhodesian Industrial Show.—The largest industrial show ever to be staged in Rhodesia, will be held in Bulawayo from May 4 to 10. It is being organized by the Federation of Rhodesian Industries and industrialists from all parts of the country will display their products, demonstrating the rapid growth of industry in Southern Rhodesia.

The Technical Information and Documents Unit which, for a number of years has been attached to the Board of Trade, will become part of the information services of the Department of Scientific and Industrial Research on April 1. For the present T.I.D.U. will remain in Lacon House, Theobald's Road, W.C.1.

Petroleum Industry Exhibition.—An exhibition—sponsored by the Shell and Anglo-Iranian groups—including every aspect of the petroleum industry, with emphasis on exploration, oil field, refinery and transport developments in many parts of the world, will be presented this summer at U.K. universities.

It will be open to the public at the Imperial College of Science and Technology, University of London, from April 6 to 21 and will then tour the universities of Glasgow, Leeds and Cambridge.

OAKLAND METAL COMPANY LIMITED
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The Mining Markets

(By Our Stock Exchange Correspondent)

The Stock Exchange has had a comparatively quiet week. Political uncertainties, the imminence of the budget and of the Easter holidays, have discouraged business. Gilt-edged stocks fell considerably. Four per cent Consols declined to 100¼ per cent, at this level the yield, after allowing for accrued interest, works out at 4 per cent; an outstanding event! The general decline has been brought about by continued selling by small investors, nervous of inflation, and noticeable lack of support from institutions and official quarters.

Kaffirs have had a patchy week, but there has been a firm undertone. Market conditions remained quiet with few sellers about. In the Orange Free State section brisk buying of Free State Geduld occurred, and the shares responded sharply. Blinkpoort moved upwards in sympathy.

West African issues recorded small gains all round, after the big increases in dividends announced by Ashanti and Bibiani last week. The leading mines are now returning attractive yields, and if the newly elected government pursues a stable policy investors may well terminate their long neglect of this market.

Coppers recovered from recent profit-taking. The chairman of Messina Transvaal Copper indicated in his report that the company has fully benefited from the continued strength of the copper market, and is expected to continue doing so. Pending the result of the meeting, the market became nominal. Later the shares eased on the absence of news concerning the hoped for scrip bonus.

Eastern tin shares recovered from their attack of jitters last week, and showed some useful gains despite erratic movements in the price of the metal. In this trend they were further helped by a crop of good dividend announcements by some of the leading Malayan producers. Nigerian mines also recorded small gains in sympathy.

Lead/zinc issues improved. The wave of small selling which took place in recent weeks appears to be drying up, and most of the leading producers rose.

Australian gold issues were a very quiet market following the news that the Governor-General had granted a dissolution of Parliament in both Houses. Mr. Menzies, the Prime Minister, is reported to have asked for this step to be taken, because of his failure to get legislation through the labour majority in the Upper House. Elections will be held on May 5. For some time past the coalition government has been reputed to hold divergent views on the question of the revaluation of the Australian pound, the Liberals being in favour of such a move, and the Country Party against it. The attitude of the Labour Party is at present uncertain. The election campaign should give a fairly clear indication of party policies on this point, but even then it will be necessary to await the results of the election before any accurate assessment can be made. One theory is that the coalition parties may agree on some compromise solution designed to curb serious internal inflation. One such suggestion is that the Australian pound should be given some measure of freedom, and be allowed to find its own level *vis a vis* the dollar and the pound sterling. The election will be watched with the keenest interest by observers in this country.

Beralt Tin & Wolfram fell away on renewed weakness in the price of metal. Associated Manganese Mines of South Africa jumped on maintained demand. The Union Government has introduced restrictions on the sale of the metal, which can now only be exported under licence. This move is thought to be a lever to assist bargaining with the United States. The U.S.A. is a large consumer of manganese and has almost a monopoly of the sulphur trade. The world shortage of the latter commodity is causing acute concern among all the manufacturing nations of the world.

FINANCE	Price Mar. 20	+ or − on week
African & European	3½xd	−¼
Anglo American Corpn.	8½	+⅛
Anglo-French	23/9	...
Anglo Transvaal Consol	41/3	...
Camp Bird	14/3	...
Central Mining (¼ shrs.)	48/9	...
Consolidated Goldfields	2⅛	−⅛
Consol. Mines Selection	35/-	−1/9
East Rand Consols	4/-	−1½d
General Mining	6⅛	...
H.E. Prop	38/9	...
Henderson's Transvaal	10/-	...
Johnnies	3⅛	−⅛
Rand Mines	7½	−⅛
Rand Selection	40/7½	+7½d
Union Corporation	11⅛	−⅛
Vereeniging Estates	5⅛	...
Writs	35/-	...
West Wits	2½	...
RAND GOLD		
Blyvoors	53/9	+3d
Brakpan	22/-	−3d
City Deep	3⅛	−⅛
Consol. Main Reef	2⅛	−⅛
Crown	5⅛	+⅛
Daggas	3½	+⅛
Dominion Reefs	2/3	...
Doornfontein	31/6	+3d
Durban Deep	4⅛	−⅛
E. Daggas	27/6	...
E. Geduld ... (4/- units)	2½	+⅛
E. Rand Props.	4⅛	...
Geduld	7⅛	−⅛
Grootvlei	42/-	−3d
Libanon	17/6	−3d
Luipaards Vlei	24/6	−3d
Marievale	22/9	−6d
Modderfontein B	6/3	...
Modderfontein East	2⅛	−⅛
New Kleinfontein	34/4½	−7½d
New Pioneer	20/7½	−7½d
Randfontein	21/6	+3d
Robinson Deep	18/3	...
Rose Deep	42/6	...
Simmer & Jack	7/9	−1½d
Springs	12/1½	−3d
Sub Nigel	3⅛	−⅛
Van Dyk	18/9	+6d
Ventersnost	32/6	...
Vlakfontein	21/3	−3d
Vogelstruisbult	26/6	...
West Driefontein	5⅛	−⅛
W. Rand Consolidated	45/7½	−7½d
Western Reefs	41/3	+1/3
O.F.S.		
Abna F.S.A.	12/9	−3d
Blinkpoort	28/1½	+2/6
Central Mining F.S.	8/3	−3d
Freddies	17/3	...
Freddies N.	11/3	+3d
Freddies S.	12/-	...
F.S. Geduld	4½	+⅛
Geoffries	17/-	−3d
Harmony	24/-	−6d
Lydenburg Estates	11/-	−3d
Middle Wits	21/-	−6d
Ofsits	2⅛xr	−⅛
President Brand	25/-	+9d
President Steyn	17/9	+3d
St. Helena	35/-	...
U.F.S.C. & G.	10/6	+3d
Virginia Deb.	74	...
Virginia Ord.	14/3	...
Welkom	45/-	...
Western Holdings	3⅛	+⅛
WEST AFRICAN GOLD		
Amalgamated Banket	2/4½	+3d
Ariston	7/9	+3d
Ashanti	30/6	+1/6
Bibiani	12/-	+1/3
Bremang	3/9	+3d
G.C. Main Reef	4/1½	+1½d
G.C. Selection Trust	9/9	+9d
Konongo	2/3	+1½d
Kwahu	4/9	+1½d
London & African Mng.	2/4½	+1½d
Lyndhurst Deep	1/3	+1½d
Marlu	2/3	+1½d
Nanwa	1/-	...
Taquah & Abosso	8/1½	+1½d
AUSTRALIAN GOLD		
Boulder Perseverance	4/-	−3d
Gold Mines of Kalgoorlie	15/9	−3d
Great Boulder Prop.	7/-	...
Great Western Consol.	1/6	...
Lake View and Star	22/-	...
Mount Morgan	21/-	...
North Kalgurli	19/-	...
Paringa	1/-	...
Sons of Gwalia	14/6	...
South Kalgurli	10/-	...
Western Mining	7/1½	+1½d
Wiluna	11/9	...
MISCELLANEOUS GOLD		
Cam and Motor	36/10½	−7½d
Champion Reef	12/1½	−4½d
Falcon Mines	1/-	−6d
Globe & Phoenix	25/6	...
MISCELLANEOUS GOLD (contd)		
G.F. Rhodesian	9/-	...
London & Rhodesian	5/4½	−3d
Motapa	3/3	...
Mysore	7/6	−6d
New Guinea	1/9	−3d
Nundydroog	4/9	...
Oregeum	12/9	−3d
Oroville	36/3	−1/3
St. John d'El Rey	36/3	+3/1½
Zams		...
DIAMONDS		
Anglo American Inv.	3⅜	−⅛
Casts	37/-	−3d
Cons. Diam. of S.W.A.	3½	−⅛
De Beers Defd. Bearer	55/6xd	...
De Beers Pfd. Bearer	17	−⅛
COPPER		
Chartered	65/-	+3d
Indian Copper	4/9	−1½d
Messina	5⅞	−⅛
Nchanga	6⅜	+⅛
Rhod. Anglo-American	57/3	+6d
Rhodesian Selection	36/9	+1/-
Rhokana	19½	+⅛
Rio Tinto	22½	+⅛
Roan Antelope	19/-	+7½d
Selection Trust	46/3	+1/-
Tanks	43/9	+2/6
Tharsis Sulphur Br.	52/6	−2/6
TIN (Eastern)		
Anglo-Burma	6/3	−3d
Aver Hitam	27/-	+1½d
Bangrin	36/10½	+10½d
Gopeng	15/3	+7½d
Hongkong	13/9	−3d
Ipoh	33/1½	+7½d
Kamunting	12/-	+4½d
Kepong Dredging	14/4½	+4½d
Kinta Tin Mines	17/9	+1/6
Kramat Pulai	4/9	...
Malayan Dredging	26/9	+3d
Pahang	17/6	+1/6
Pengkalen	10/9	...
Petaling	12/10½	−1½d
Rambutan	20/6	+6d
Siamese Tin	25/-	−3d
Southern Kinta	15/4½	+1½d
S. Malayan	31/6	+6d
S. Tronoh	24/6	+9d
Sungei Kinta	20/-	...
Tekka Taiping	12/-	...
Tronoh	31/9	+6d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	12/3xd	−1½d
Beralt Tin	21/-	−2/6
Bisichi	4/6	+3d
British Tin Inv.	17/3	+7½d
Ex-Lands Nigeria	7/10½	+3d
Geevor Tin	16/3	+1/3
Gold & Base Metal	4/-	...
Tantar Nigeria	7/10½	+1½d
Jos Tin Area	11/3	...
Kaduna Prospectors	4/3xd	−2/6
Kaduna Syndicate	7/9xd	−6/9
London Tin	5/6	+1½d
Ribon Valley	1/6	+1½d
United Tin	2/6	−1½d
SILVER, LEAD, ZINC		
Broken Hill South	55/-	+6d
Burma Corporation	4/4½	−3d
Consol. Zinc	31/3	+1/-
Lake George	27/3	+3d
Mining Trust	5/-	...
Mount Isa	38/-	−3d
New Broken Hill	29/-	+3d
North Broken Hill	75/-	+1/9
Rhodesian Broken Hill	20/3	+10½d
San Francisco Mines	61/10½	+3/9
Trepca	3/7½	...
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	3⅜	−⅛
Associated Manganese	72/-	+2/-
Chinese Engineering	2/6	+3d
C.P. Manganese	55/3	−1/-
Natal Navigation	5¼	+⅛
Wankie	21/6	+6d
Witbank Colliery	4⅜	...
CANADIAN MINES		
Dome	$32	+1
Hudson Bay Mining	$112	−2
International Nickel	$73½	+1⅛
Mining Corpn. of Canada	£6⅜	...
Noranda	$155	−5
Quemont	£9⅛	−⅛
OIL		
Anglo-Iranian	5⅜	−⅛
Apex	46/10½	+7½d
Attock	24/4½	−7½d
Burmah	53/9	−3/1½
Canadian Eagle Bearer	34/7½	+1/4½
Mexican Eagle	23/7½	...
Shell	4⅜	+⅛
Trinidad Leasehold	25/9	−1/3
T.P.D.	30/6	−1/6
Ultramar	36/4½	−3d

Company News & Views

The Virile Brakpan Mines

Remarkable vigour is shown by the Brakpan Mines, the forty-eight year old gold producer under the technical control of the Anglo American Corporation. The company has virtually completed the development of the area on which work originally commenced and has been giving attention to the remaining parts of the Witpoort area. The annual report for 1950 shows that the footage of development work accomplished last year was 69,521 compared with 62,375 ft. and of the 54,940 ft. sampled, 14,205 ft. were payable, averaging 13.77 dwt. over 34.90 in. There is a big drop in ore reserves of just over 1,000,000 tons to 3,825,200 tons of 4.58 dwt.

The tonnage milled during 1950 showed an increase of 100,000 at 1,401,000 tons and was the highest since 1942. The yield per ton was 3.78 dwt. compared with 3.91 dwt. for 1949, but the revenue per ton was 8s. 6.2d. greater than in the previous year at 47s. 8.2d. due to the higher price of gold. There was a further upward trend in costs which increased from 32s. 0.4d. to 34s. 1.8d. and the resulting profit per ton at 13s. 6.4d. rose by 6s. 4.8d. This had the effect of more than doubling the previous year's profit of £463,963 to £948,026. The increase was due to the higher tonnage milled coupled with the benefit of the enhanced price of the metal obtained over the whole year's output. Revenue from premium gold sales amounted to £48,041.

Dividends paid amounted to 2s. 1½d. per share or exactly double those of the previous year.

Springs Big Profit Increase

The higher price for gold and the advantages derived from the acquisition of West Springs property were conjointly responsible for the attractive showing made by Springs Mines last year. It had already been manifest from outputs and progress reports that the amalgamation of these two members of the Anglo American group was a well-conceived idea, and the annual report for 1950, once again underlines the fact.

The tonnage milled during the year totalled 2,125,500, being 166,500 tons more than for 1949. The yield decreased by 0.29 dwt. to 2.63 dwt., but the higher average gold price resulted in the revenue per ton increasing by 3s. 11.7d. to 33s. 2.1d. Working costs showed an increase from 25s. 3.5d. to 26s. 2.0d. and the resultant profit per ton at 7s. 0.1d. was 3s. 1.2d. greater. The total working profit for the year was almost doubled at £745,260. An amount of £32,849 was allocated for capital expenditure and that required for the current year is put at £30,000. Dividends paid totalled 1s. 1½d. per share as against 6d. per share in 1949 and absorbed £568,688.

Development was done on both the Main and Kimberley Reefs, and of the 28,648 ft. opened up on the former, 22,935 ft. were sampled, of which 35.9 per cent proved payable, averaging 21.74 dwt. Of the 11,658 ft. developed on the Kimberley Reef horizon, 10,565 ft. were sampled, payability being 21.3 per cent, averaging 11.11 dwt. A small increase is recorded in the Ore reserves which amount to 4,042,500 tons against 3,994,400, the value being a trifle higher at 4.32 dwt. Included in this is a tonnage of 379,700 on the Kimberley Reef series.

Two South African Colliery Results

The difficulties of the coal industry in this country have not been experienced by the colliery enterprises in South Africa. There pit-head costs, although rising, have not increased bevond an economic level and the companies have been able to meet home consumption at fair prices and take full advantage of overseas requirements.

Two of the well-known coal-producing undertakings under the aegis of the Anglo American Corporation—Amalgamated Collieries of S.A. and Springbok Colliery—are able to give a satisfactory account of operations during the year 1950.

Amalgamated Collieries has been engaged in a programme of expansion and development which is estimated to cost around £2,500,000 by 1954. The company was incorporated in 1936 and from its inception to 1945 paid an annual dividend of 10 per cent, the rate since then having been gradually increased; that for 1950 being 15 per cent. This called for £379,500 out of the net profit of £474,355, while an amount of £60,707 was required for taxation. The greater part of the company's coal is obtained from the Cornelia and Springfield collieries and smaller amounts from Schoongezicht and Largo; the total amount produced last year was 6,790,748 tons. A large part of the output is supplied to the Electricity Supply Commission, the balance being sold in the local market at Vereeniging for industrial and domestic purposes.

Operations of Springbok Colliery, although not on such an ambitious scale, were equally successful during 1950. For the third year in succession, sales output rose and attained a figure of 901,626 tons. The profit earned increased by £24,214 to £207,161. Taxation called for £36,700 and the dividend, stepped up from 1s. 4½d. to 1s. 6d., absorbed £157,500. Working costs were higher but as a result of improved business in the export market, the average selling price obtained was also higher. Mining conditions are satisfactory and coal of normal quality and thickness continues to be exposed in all development faces.

Successful Year for Consolidated Mines Selection

We much regret that in last week's issue when commenting in these columns on the annual report of Consolidated Mines Selection two literals appeared. Hamburg Bank should have read Hambros Bank, and Coart Products should have read Boart Products.

HILGER AND WATTS

The Third Annual General Meeting of Hilger & Watts Ltd., was held on March 19 in London.

Mr. G. A. Whipple, M.A., M.I.E.E. (Chairman and Managing Director), in the course of his speech said: The net profit for the year amounted to £35,753 or £4,475 less than for the previous year. The directors are recommending a first and final dividend on the Ordinary shares of 7½ per cent, less income tax, which is the same rate of dividend as was paid last year.

Trading in the period concerned was not easy since the major portion of the company's orders were for export and consequently were subject to the many hindrances attributable to foreign import licence control and to the availability of sterling in the countries concerned.

The demand for our products continues to be satisfactory, the most noteworthy feature being the increase in orders from the United States of America, which is now our third largest overseas customer.

I referred last year to the establishment of companies in Canada and South Africa by Scientific Exports (Great Britain) Ltd., an export marketing company of which we are founder members. You will be interested to learn that as a result of this development Canadian business is expanding, while the effort and expense of training technicians from the newly established South African company have been justified by a substantial rise in orders from that territory.

During the year under review work in our research and development departments was intensified through the enlargement of facilities at Camden Town and was directed into two main channels. First, the evolution of new instruments for research and industry, and secondly, the revision of designs to ensure greater ease in manufacture and assembly.

Your company is best known as makers of high quality optical and mechanical instruments. It is a sign of the times, and a pointer to the future, to note that the trend of modern development in these fields has required that a substantial and capable electronic section be constituted in our research department.

The British scientific instrument industry is staging a National Instrument Exhibition for the first time in July this year. The exhibition will be held in the National Hall, Olympia, London, and I shall be pleased to make arrangements for any shareholder to inspect the products which we are exhibiting.

The report was adopted.

AMALGAMATED COLLIERIES OF SOUTH AFRICA, LTD.

(Incorporated in the Union of South Africa)

The fifteenth Annual General Meeting of Amalgamated Collieries of South Africa, Ltd., will be held at 65, President Street, Johannesburg, on April 19.

The following is an extract from a statement by the chairman, **Mr. T. Colter,** dated March 16, 1951, circulated with the annual report and accounts for the year ended December 31, 1950:

Your company conducts its business of coal mining firstly, through the directly operated collieries Cornelia, near Vereeniging, and Schoongezicht, near Witbank, and, secondly, through its wholly owned subsidiaries, Springfield Collieries, Ltd., which has its present pits near Vereeniging and its new pits near Grootvlei Station, in the Heidelberg district, and Largo Colliery Company, Ltd., which has its pits near Springs.

The supply contracts with our principal consumer, the Electricity Supply Commission, are of long duration and on a cost-plus-profit basis. The demand under these contracts is of a high and steady order, thus providing stability of trade.

The following is a comparative summary of the sales outputs of the company's collieries and subsidiary companies in the years 1949 and 1950:

	Tons 1949	Tons 1950
Cornelia	2,702,834	2,738,148
Schoongezicht	974,940	924,020
Springfield (East and West)	2,573,441	2,519,013
Largo	614,816	609,567
	6,866,031	6,790,748

Net profits earned by your company during 1950 amounted to £474,355. Taxation calculated on such profits and payable in respect of the fiscal year ending June 30, 1951, plus an adjustment in respect of the previous year, is £60,707, so that there remained, on the year's operations, a distributable profit of £413,648, equal to slightly more than 16¼ per cent on the issued capital of £2,530,000. Dividend distributions totalled £379,500, equal to a rate of 15 per cent which was an increase of 1½ per cent on the 1949 rate.

Dealing first with Cornelia Colliery, the establishment of Bertha No. 2 shaft, which is designed to meet the requirements of the additional generating sets at Vaal power station, has proceeded according to plan. We had expected this pit to come into production during the first half of 1951, but delays in the delivery of certain essential equipment for the power station have postponed coal production and it is now expected that operations will commence during the second half of 1951. During the following 18 months the rate of production will be on a rising scale to an output of the order of 1,000,000 sales tons of coal per annum, as compared with the capacity of the new colliery, which has been designed to give an output of 1,500,000 tons per annum.

Referring now to the other directly operated colliery, Schoongezicht, work on the replacement of this pit on a section of the coalfield owned by Witbank Coal Holdings, Ltd., and to be leased from that company, has made excellent progress, and we expect to commence production from the new colliery towards the end of 1951. As you know, the capacity of the new pit on single shift operation will be of the order of 900,000 tons of coal per annum.

With regard to the subsidiary company, Springfield Collieries, Ltd., the existing pits, situated near to the Klip power station, are nearing the end of their economic lives and a replacement colliery has been established near Grootvlei railway station, south of Balfour.

Coal deliveries on a small scale to the Klip power station, under the long-term contract with the Electricity Supply Commission, commenced in February, 1951. These supplies will gradually increase until the whole of the present output from the old pits is taken over by the new colliery.

As you are aware, your company holds a considerable interest in Bleshok Colliery, Ltd. Production at this new colliery commenced in July, 1950. During the six months ended December 31, 1950, 154,277 tons of coal were supplied to Iscor. A maiden dividend of 2½ per cent, equal to 1½d. per share, was declared in December, 1950.

During the year 1950 the collieries of the Union of South Africa produced and sold 29,181,801 tons of coal, compared with 27,569,246 tons for the year 1949, showing an increase of 1,612,555 tons.

Your group of collieries, together with associates within the Anglo American group, accounted for 11,780,148 sales tons, equal to 40.368 per cent of the total Union production.

In so far as the Transvaal coal industry is concerned, disposals for export and bunker purposes have again been disappointing due to shortage of railway trucks and the lack of shipping facilities.

PETALING TIN, LTD.

(Incorporated in the Federation of Malaya)

ANOTHER SUCCESSFUL YEAR

The twenty-fifth Annual General Meeting of Petaling Tin, Ltd., was held on February 28, 1951, in Ipoh, Malaya.

Mr. J. T. Chappel, M.I.M.M., chairman of the company, presided, and in moving the adoption of the report and accounts for the year ended October 31, 1950, said the company had another very successful year and earned a net profit of $3,227,443 (£376,535). Interim dividends of 60 per cent were paid during the year and a final of 25 per cent on the recently increased capital of $4,400,000 (£513,333) is proposed; an appropriation of $1,500,000 (£175,000) has been made to general reserve, and a slightly lower balance of $1,041,547 (£121,514) is left to be carried forward.

NEW PROSPECTIVE MINING RIGHTS

In view of the increasing difficulty of acquiring new areas, we are fortunate in having obtained prospective mining rights over 538 acres of the property of Seaport (Selangor) Rubber Estate Ltd., situated only five miles from the Puchong area, to which reference is made in the directors' report. Subject to the necessary conversion to mining title being approved by Government, it is intended to transfer the No. 5 dredge to this area as soon as the material required in connection with its re-erection can be obtained and unless the delivery of material is unduly delayed by the demands of the U.K. rearmament programme, it is hoped that dredging will commence at Seaport Estate in the first half of 1953. The area is low grade, but the ground is very suitable for treatment by the No. 5 dredge and it should provide a profitable additional life for this unit of approximately eight years, provided the tin price does not fall below £600 per ton.

Last year I referred to arrangements under consideration for the opening up with gravel pumps of an experimental area in the northern part of the property, in which check-boring had indicated the presence of a considerable volume of ore-bearing ground below the previous maximum digging depth, and I can now add that delivery of the plant is expected shortly.

PRICE OF TIN

Taking the long view, the spectacular rise in the tin price in recent months is a matter of concern to producers, as under normal circumstances world production should now be adequate to meet genuine consumption and there is little doubt that the present demand for the metal is mainly due to stockpiling requirements. Another regrettable factor of the present position is that the U.S.A. has found it necessary to re-impose drastic restrictions in the end uses of tin, in order to divert metal to the stockpile with resultant encouragement to the search for substitutes.

Following discussions over a long period by the International Tin Study group, it was decided at a meeting of the group in Paris last March, to recommend to member Governments that U.N.O. should be requested to call a commodity conference to consider proposals for a commodity agreement. This conference was convened at Geneva last October, but it adjourned after a month's discussion without reaching agreement. While consideration of a commodity agreement for tin may not be a matter for urgent consideration under present circumstances, many producers consider that it would be prudent to prepare an agreement to meet the changed circumstances which may be expected to arise when conditions return to normal, and it is hoped that further consideration by the Governments concerned, particularly the U.S.A., will yet produce an agreement acceptable to both consumers and producers.

QUESTION OF CONTROL

It now appears that some form of inter-Governmental control of the distribution of commodities is again contemplated, as an official statement issued jointly last month by the Governments of the United Kingdom, France and the United States of America contained the following announcement:

"The three Governments have agreed that proposals should be made to the other interested Governments for the creation of a number of standing international 'commodity groups' representing the Governments of producing and consuming countries throughout the free world which have a substantial interest in the commodities concerned. These commodity groups would consider and recommend to Governments the specific action which should be taken in the case of each commodity in order to expand production, increase availabilities, conserve supplies and assure the most effective distribution and utilization of supplies among the consuming countries.

"Early action is called for with respect to certain commodities. The Government of the United States has therefore agreed to send invitations immediately to other interested friendly Governments for the establishment of certain of the standing commodity groups referred to above."

If, as appears probable, one of the proposed "commodity groups" is to be set up for tin, it is imperative that the

Malayan mining industry should be fully consulted before any commitment affecting the disposal of its production is entered into by Government.

During recent months considerable progress has at last been made by the War Damage Commission in the assessment of the mining industry's claims for War Damage and Losses, according to principles laid down by the Commission after consultation with representatives of the industry, and advice of the company's award may be expected shortly.

TRIBUTE TO STAFF AND LABOUR FORCE

The state of emergency continues to be a matter of great concern, and I would again pay tribute to the staff and labour force at the mine for the efficient manner in which they have carried out their duties under very trying circumstances. The more stringent measures recently adopted by the authorities, including the direction of manpower, the re-settlement of squatters, and the re-grouping of labour were long overdue. While there is no doubt that such measures must add temporarily to the problems of mine and estate management and necessitate considerable expenditure by large employers of labour, the authorities are assured of the full co-operation of all right-minded people in Malaya in implementing them, provided they exercise their extensive powers under the Emergency Regulations in a reasonable and equitable manner.

The chairman concluded by announcing the declaration of an interim dividend of 30 per cent.

The report and accounts were adopted.

SOUTH AFRICAN TOWNSHIPS, MINING AND FINANCE CORP. LTD.

(Incorporated in the Union of South Africa)

DIVIDEND No. 43

SHARE WARRANT COUPON No. 45

With reference to the notice of declaration of dividend published in the Press on February 24, 1951, the following information is published for the guidance of holders of Share Warrants to Bearers:—

The DIVIDEND on Shares represented by SHARE WARRANTS TO BEARER will be PAID on or after April 11, 1951, after surrender of the appropriate Coupons at THE STANDARD BANK OF SOUTH AFRICA LIMITED, 10, Clements Lane, London, E.C.4, where listing forms may be obtained.

Coupons must be left four clear days for examination and may be presented any day (Saturdays excepted) between the hours of 11 a.m. and 2 p.m.

Coupons may also be presented for payment in French currency at Banque de l'Union Parisienne, 6 & 8, Boulevard Haussmann, Paris 9e, and in this case will be subject to the deduction of the appropriate French Taxes after deduction of South African Non-resident Shareholders' Tax as specified hereunder.

Union of South Africa Non-resident Shareholders' Tax will be deducted at the rate of 7½ per cent from the dividend payable in respect of all Share Warrant Coupons. United Kingdom Income Tax will also be deducted from Coupons presented for payment at The Standard Bank of South Africa Ltd., London, unless Coupons are accompanied by Inland Revenue declarations. Where such deduction is made, the net amount of the dividend will be 3.92d. per share, viz.:—

	Per Share Pence
Amount declared (in British currency at par)	6
Less: South African Non-resident Shareholders' Tax at 1s. 6d. in the £	.45
	5.55
Less: United Kingdom Income Tax at 4s. 7d. in the £ on the gross amount of the dividend of 7.12d.	1.63
	3.92

For and on behalf of
ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED,
London Secretaries,
W. E. GROVES.

London Office, 11, Old Jewry, E.C.2.
March 21, 1951.

NOTE—The Corporation has been requested by the Commissioners of Inland Revenue to state:—

The deduction of tax at the reduced rate of 4s. 7d. in the £ instead of at the Standard Rate of 9s. in the £ represents a *provisional* allowance of relief at the rate of 4s. 5d. in the £. This relief has been authorised by the Commissioners of Inland Revenue in respect of Income Taxes imposed in the Union of South Africa including the non-resident shareholders' tax. The final rate of relief allowable to a particular shareholder depends on the shareholder's personal rate of tax, and may be less than 4s. 5d. in the £. Revision of the relief involves a corresponding adjustment of the amount shown above as the gross amount of the dividend for United Kingdom tax purposes.

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GENERAL MANAGER required for Midlands quarry group; must have engineering training and administrative experience. Knowledge of hardstone quarrying desirable, but not essential. Will be required also to handle commercial side. Age 40 to 50. Please write stating experience and salary required to Box No. 504, Mining Journal Ltd., 15, George Street, London, E.C.4.

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CHIEF METALLURGIST required for The Nanwa Gold Mines Limited, with experience of roasting and cyanidation. Salary £1,200 per annum, plus £120 per annum, at present, cost of living allowance; initial agreement 15 months. No accommodation for wives; free passage; furnished accommodation, medical attendance, pension scheme; three months' leave on full pay after 15 months' satisfactory service. Applicants to be qualified to take complete charge of Company's Ore Treatment Plant. Apply with full details of previous experience and qualifications with copies of references, to Investigations & Management Ltd., Finsbury House, Blomfield Street, London, E.C.2.

NATIONAL COAL BOARD.—Applications are invited for the post of ASSISTANT POWER GENERATION ENGINEER in the Production Department at London Headquarters.

The duties of the post involve the preparation of schemes for pithead power stations using low grade fuel, and investigations in connection with colliery power supplies generally.

Candidates should be Corporate Members of the Institution of Electrical Engineers or the Institution of Mechanical Engineers; should have served an approved apprenticeship training in power plant engineering; and should have had at least 10 years experience in connection with steam power station operation and/or construction.

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Apply in writing, giving full particulars (in chronological order) of age, education, qualifications and experience (with date) to National Coal Board, Establishments (Personnel), Hobart House, Grosvenor Place, London, S.W.1, marking envelope TT/304. Original testimonials should NOT be forwarded. Closing date April 21, 1951.

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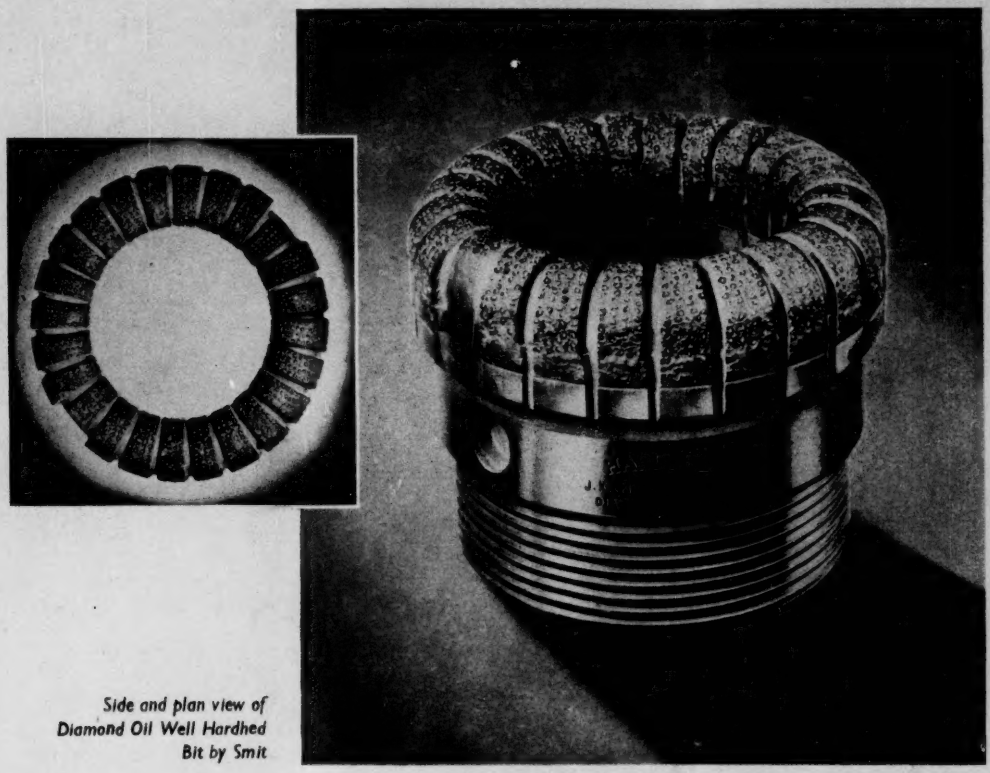

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